

#5



SEQUENCE LISTING

<110> Allen, Stephen  
Kinney, Anthony  
Miao, Guo-Hua  
Orozco, Emil

<120> PLANT BIOTIN SYNTHASE

<130> BB1429 US NA

<140> US 09/740288

<141> 2000-12-19

<150> US 60/172929

<151> 1999-12-21

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cgcctccgcc gttagcgccg cgcccttctc atcggtatcg gcggccgcgg cggaggcgga 180  
cgggcggtgc gggacggggc caggaacgac tggaccgcgc ccgagatcca ggccatctac 240  
gactccccgc tcctcgacct cctcttccac ggggctcaag tccataggaa tgtccataaa 300  
tttagagaag tgcaacaatg cacacttctt tcaataaaga ctggtgggtg cagcgaagat 360  
tgttcatact gccacagtc ttcaagatac agtaccggat tgaaggctga aaaattaatg 420  
aagaaagatg ccgtcctaga agcagctaaa aaggcaaagn angctgggag caccgcgattt 480  
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Sequence 1000000

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 cgctgctcct ctatcccttt cctgctgctg ctactacctt aagctatcac tatcatggcc 180  
 ttgatgctgc tagcgcgcaa cctgcgctcc cgccctccgc caccgctcgc cgccgcccgc 240  
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 ggggntcagt catcaagata caacactgga ttgaagggcc aaaaattgat gaacaaatat 420  
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 Arg Ala Ile Arg Asp Gly Pro Arg Asn Asp Trp Ser Arg Pro Glu Xaa  
 35 40 45  
 Xaa Ala Val Tyr Asp Ser Pro Leu Leu Asp Leu Leu Phe His Gly Xaa  
 50 55 60

Gln Ser Ser Arg Tyr Asn Thr Gly Leu Lys Gly Gln Lys Leu Met Asn  
65 70 75 80  
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Gln Pro Phe Leu His Gly  
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tatcatggcc ttgatgctgc tagcgcgcaa cctgcgctcc cgctccgcc caccgctcgc 180  
cgccgccgcg gngttctcgt cggccgcggc ggaggcggag agggcgatac gggacgggcc 240  
gcggaacgac tggagccggc ccgagattca agccgtctac gactcaccgc tctcgacct 300  
cctctttcac ggggctcaag tccacagaaa tgtccataaa ttcaagagaa gtgcagcaat 360  
gcacacttct ttcaatcaag actggtggga tgcagtgaag attgttctta ctgtcctcaa 420  
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| <213> | Zea mays |

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| cgcccgtctg  | tcctctatcc  | ctttcctgct | gctgctacta | ccttaagcta | tcactatcat |  | 120 |
| ggccttgatg  | ctgctagcgc  | gcaacctggc | ctcccgctc  | cgccccaccg | tcgcccgcgc |  | 180 |
| cgcggcgctt  | tcgtctggcg  | cggcggaggc | ggagagggcg | atacgggacg | ggccgcggaa |  | 240 |
| cgaactggag  | cggcccgaga  | tccaggcgct | ctacgactca | ccgctcctcg | acctcctctt |  | 300 |
| tcacggggct  | cagggtccaca | gaaatgtcca | taaattcaga | gaagtgcagc | aatgcacact |  | 360 |
| tctttcaatc  | aagactggtg  | gatgcagtga | agattgttct | tactgtcctc | agtcatcaag |  | 420 |
| atacaacact  | ggattgaagg  | cccaaaaatt | gatgaacaaa | tatgctgtct | tggaagcagc |  | 480 |
| aaaaaaaggca | aaagagtctg  | ggagcacccg | tttttgcatg | ggagctgcat | ggagagaaac |  | 540 |
| cattggcag   | aaatcaaat   | tcaaccagat | tcttgaatat | gtcaaggaaa | taagggtgat |  | 600 |
| cgqcatggaq  | qtctgtttqca | cactaqqcat | qataaqaaaa | caacaagctg | aagaactcaa |  | 660 |

|            |            |            |            |            |             |      |
|------------|------------|------------|------------|------------|-------------|------|
| gaaggctgga | cttacagcat | ataatcataa | cctagatata | tcaagagagt | attatcccaa  | 720  |
| cattattacc | acaagatcat | atgatgatag | actgcagact | cttgagcatg | tccgtgaagc  | 780  |
| tggaataagc | atctgctcag | gtggaatcat | tggtcttggt | gaagcagagg | aggaccgggt  | 840  |
| agggttggtg | cataccctag | ctaccttgcc | tacacacca  | gagagcggtc | ctattaatgc  | 900  |
| attggttgct | gtaaaaggca | cacctcttga | ggaccagaag | cctgtagaga | tctgggaaat  | 960  |
| gatccgcatg | atcgccactg | ctcggatcac | gatgccaaag | gcaatggtga | ggctttcagc  | 1020 |
| aggccgagta | cggttctcga | tgccagaaca | agcgctgtgc | ttcctcgctg | gggccaaactc | 1080 |
| catccttgcc | ggcgagaaac | ttctcacaac | cgcaaacaac | gactttgatg | cggaccaagc  | 1140 |
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<400> 8

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| Met | Ala | Leu | Met | Leu | Leu | Ala | Arg | Asn | Leu | Arg | Ser | Arg | Leu | Arg | Pro |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Pro | Leu | Ala | Ala | Ala | Ala | Ala | Phe | Ser | Ser | Ala | Ala | Ala | Glu | Ala | Glu |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Ala | Ile | Arg | Asp | Gly | Pro | Arg | Asn | Asp | Trp | Ser | Arg | Pro | Glu | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gln | Ala | Val | Tyr | Asp | Ser | Pro | Leu | Leu | Asp | Leu | Leu | Phe | His | Gly | Ala |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Gln | Val | His | Arg | Asn | Val | His | Lys | Phe | Arg | Glu | Val | Gln | Gln | Cys | Thr |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Leu | Ser | Ile | Lys | Thr | Gly | Gly | Cys | Ser | Glu | Asp | Cys | Ser | Tyr | Cys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Pro | Gln | Ser | Ser | Arg | Tyr | Asn | Thr | Gly | Leu | Lys | Ala | Gln | Lys | Leu | Met |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Asn | Lys | Tyr | Ala | Val | Leu | Glu | Ala | Ala | Lys | Lys | Ala | Lys | Glu | Ser | Gly |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ser | Thr | Arg | Phe | Cys | Met | Gly | Ala | Ala | Trp | Arg | Glu | Thr | Ile | Gly | Arg |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Lys | Ser | Asn | Phe | Asn | Gln | Ile | Leu | Glu | Tyr | Val | Lys | Glu | Ile | Arg | Gly |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Met | Gly | Met | Glu | Val | Cys | Cys | Thr | Leu | Gly | Met | Ile | Glu | Lys | Gln | Gln |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ala | Glu | Glu | Leu | Lys | Lys | Ala | Gly | Leu | Thr | Ala | Tyr | Asn | His | Asn | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Asp | Thr | Ser | Arg | Glu | Tyr | Tyr | Pro | Asn | Ile | Ile | Thr | Thr | Arg | Ser | Tyr |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Asp | Arg | Leu | Gln | Thr | Leu | Glu | His | Val | Arg | Glu | Ala | Gly | Ile | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ile | Cys | Ser | Gly | Gly | Ile | Ile | Gly | Leu | Gly | Glu | Ala | Glu | Glu | Asp | Arg |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | Gly | Leu | Leu | His | Thr | Leu | Ala | Thr | Leu | Pro | Thr | His | Pro | Glu | Ser |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Pro | Ile | Asn | Ala | Leu | Val | Ala | Val | Lys | Gly | Thr | Pro | Leu | Glu | Asp |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Gln | Lys | Pro | Val | Glu | Ile | Trp | Glu | Met | Ile | Arg | Met | Ile | Ala | Thr | Ala |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Arg | Ile | Thr | Met | Pro | Lys | Ala | Met | Val | Arg | Leu | Ser | Ala | Gly | Arg | Val |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Arg | Phe | Ser | Met | Pro | Glu | Gln | Ala | Leu | Cys | Phe | Leu | Ala | Gly | Ala | Asn |

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 gttgttgtct gttgtctctg tctgtctctat attcgcagat ctctcactca ttctctgttg 180  
 tttctctgcc caacttcgaa ttcgaaagca aaaacatggt tttggcgaga cccattttcc 240  
 gagcaccctc cctttgggcg ttgcaactct cctacgcgta ttcctctgcc tcagcagctg 300  
 caattcaagc tgagagagcc atcaaagaag gaccagaaa cgattggagc cgagaccaag 360  
 tcaaattccat ctacgactct cccatttctcg atcttctctt ccatggggct caagtccaca 420  
 gacatgctca taacttcagg gaagttcaac agtgtactct tctgtctatc aaaacaggag 480  
 ggtgcagtga agattgttcc tattgtcctc aatcctctaa gtatgataca ggagtcaaaa 540  
 ggccaagcct tatgaacaag gaagctgttc tccaggctgc aaagaaggca aaagaggctg 600  
 ggagcactcg cttttgtatg ggtgctgctg ggagggatac actaggaaga aagaccaact 660  
 tcaaccagat ccttgaatat gtgaaagaca taagggacat gggaatggag gtttgttgca 720  
 cccttggcat gctggagaaa cagcaggctg ttgaactcaa gaaggcagggt ctactgctt 780  
 ataatcacia tcttgacact tcaagggagt attatccaaa cataatcaca acaaggactt 840  
 atgtagagcg tcttcaaacc cttgagtttg ttcgggatgc agggatcaat gtttgttctg 900  
 gaggaattat agggcttgga gaagcagagg aggatcgtgt aggtttgtta catacattgt 960  
 caacacttcc caccocatca gagagtgttc ctattaatgc acttgttgct gtaaagggaa 1020  
 cccctcttga ggatcagaag cctgttgaaa tatgggagat gattcgcagc atagcaactg 1080  
 cacgtatcgt aatgccaaaa gcaatggtca gggtatcagc tggcagagtt cgattctcca 1140  
 tgcttgagca ggcattgtgc tttcttgctg gtgcaaattc tatattcact ggtgaaaagc 1200  
 ttctcactac tcttaacaat gattttgatg ctgatcaact catgtttaaa gttcttggac 1260  
 ttctcccaaa agctccaagc ttacatgaag gtgaaactag tgtgacagaa gattataagg 1320  
 aagcagcttc ttctagttga 1340

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 Glu Arg Ala Ile Lys Glu Gly Pro Arg Asn Asp Trp Ser Arg Asp Gln  
 35 40 45  
 Val Lys Ser Ile Tyr Asp Ser Pro Ile Leu Asp Leu Leu Phe His Gly  
 50 55 60  
 Ala Gln Val His Arg His Ala His Asn Phe Arg Glu Val Gln Gln Cys  
 65 70 75 80  
 Thr Leu Leu Ser Ile Lys Thr Gly Gly Cys Ser Glu Asp Cys Ser Tyr  
 85 90 95  
 Cys Pro Gln Ser Ser Lys Tyr Asp Thr Gly Val Lys Arg Pro Ser Leu  
 100 105 110  
 Met Asn Lys Glu Ala Val Leu Gln Ala Ala Lys Lys Ala Lys Glu Ala  
 115 120 125  
 Gly Ser Thr Arg Phe Cys Met Gly Ala Ala Trp Arg Asp Thr Leu Gly  
 130 135 140  
 Arg Lys Thr Asn Phe Asn Gln Ile Leu Glu Tyr Val Lys Asp Ile Arg  
 145 150 155 160



Asp Met Gly Met Glu Val Cys Cys Thr Leu Gly Met Leu Glu Lys Gln  
 165 170 175  
 Gln Ala Val Glu Leu Lys Lys Ala Gly Leu Thr Ala Tyr Asn His Asn  
 180 185 190  
 Leu Asp Thr Ser Arg Glu Tyr Tyr Pro Asn Ile Ile Thr Thr Arg Thr  
 195 200 205  
 Tyr Asp Glu Arg Leu Gln Thr Leu Glu Phe Val Arg Asp Ala Gly Ile  
 210 215 220  
 Asn Val Cys Ser Gly Gly Ile Ile Gly Leu Gly Glu Ala Glu Glu Asp  
 225 230 235 240  
 Arg Val Gly Leu Leu His Thr Leu Ser Thr Leu Pro Thr His Pro Glu  
 245 250 255  
 Ser Val Pro Ile Asn Ala Leu Val Ala Val Lys Gly Thr Pro Leu Glu  
 260 265 270  
 Asp Gln Lys Pro Val Glu Ile Trp Glu Met Ile Arg Met Ile Ala Thr  
 275 280 285  
 Ala Arg Ile Val Met Pro Lys Ala Met Val Arg Leu Ser Ala Gly Arg  
 290 295 300  
 Val Arg Phe Ser Met Pro Glu Gln Ala Leu Cys Phe Leu Ala Gly Ala  
 305 310 315 320  
 Asn Ser Ile Phe Thr Gly Glu Lys Leu Leu Thr Thr Pro Asn Asn Asp  
 325 330 335  
 Phe Asp Ala Asp Gln Leu Met Phe Lys Val Leu Gly Leu Leu Pro Lys  
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 Ala Pro Ser Leu His Glu Gly Glu Thr Ser Val Thr Glu Asp Tyr Lys  
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 Glu Ala Ala Ser Ser Ser  
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 <211> 479  
 <212> DNA  
 <213> Glycine max

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 actcgacact atctcttctt ctgttcgtct tcaagttcaa aagtcgagaa actatggtac 120  
 cgtatcatct gttcctcctc aagctacaga aacatcaagc acatcaccta gtaaggatgt 180  
 ctaccaagaa gcactcaacg caactgaacc ccgcagcaat tggacaagag aagaaatcaa 240  
 ggcgatctat gataagccat tgatggagtt atgttggggg gctggtagtt tgcacaggaa 300  
 attccatata cctgggggcta ttcagatgtg tacattgttg aacatcaaga cgggtggttg 360  
 ctcgaggagg ttgttcttac tggcgcccaa tcatcccgct accaaaccgg tctcaaagcc 420  
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<220>

<221> Unsure

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<221> Unsure

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<221> Unsure

<222> (577)..(578)

<223> n = A, C, G, or T

<400> 15

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| gggagccgca | tggagagaga  | caattggcag | gaaaacaaat | ttcaaccaga | ttcttgaata  | 120 |
| tgtcaaggac | ataagaggta  | tgggcatgga | ggtctgttgc | accctgggca | tgctagagaa  | 180 |
| acaacaagct | gaagaactcc  | aagaaggctg | gactttacag | cttataatca | taacctaaaga | 240 |
| tacatccaag | agaatattac  | ccccaacatt | tattcctaca | agattccggt | accgatggat  | 300 |
| tagatttacc | agctcctttc  | nagcatgtcc | cnttnnaagc | tgggaattaa | gccgtcctgg  | 360 |
| tccaaggtg  | ggaattttatt | gggccctttg | ggagaaggcc | ggnaggnaaa | cccgtttttt  | 420 |
| aggctggttt | gccatacact  | gggccacttt | tttgcccaac | acaccccaag | agagcggtcc  | 480 |
| cctatccaat | gcatttgatt  | gccctgtcca | agggancctc | ccttccaagg | ttttaaaanc  | 540 |
| cctgttnaan | atatnggaaa  | ttattnccgc | atgattnncc | aaccacgg   |             | 589 |

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<211> 78

<212> PRT

<213> Triticum aestivum

<220>

<221> UNSURE

<222> (69)..(69)

<223> Xaa = any amino acid

<400> 16

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| Asp | Ala | Val | Leu | Glu | Ala | Ala | Lys | Lys | Ala | Lys | Glu | Ala | Gly | Ser | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Arg | Phe | Cys | Met | Gly | Ala | Ala | Trp | Arg | Glu | Thr | Ile | Gly | Arg | Lys | Thr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Asn | Phe | Asn | Gln | Ile | Leu | Glu | Tyr | Val | Lys | Asp | Ile | Arg | Gly | Met | Gly |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Met | Glu | Val | Cys | Cys | Thr | Leu | Gly | Met | Leu | Glu | Lys | Gln | Gln | Ala | Glu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Glu | Leu | Gln | Glu | Xaa | Asp | Phe | Thr | Ala | Tyr | Asn | His | Asn | Leu |     |     |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |     |

<210> 17  
 <211> 1396  
 <212> DNA  
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<400> 17  
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 ccccttcgc ctccgcggtt agcgccgcgc ccttctcatc ggtatcggcg gccgcggcgg 180  
 aggcggagcg ggcgggtgcg gacgggcca ggaacgactg gaccgcccc gagatccagg 240  
 ccatctacga ctccccgctc ctcgacctcc tcttcacgg ggctcaagtc cataggaatg 300  
 tccataaatt tagagaagtg caacaatgca cacttctttc aataaagact ggtgggtgca 360  
 gcgaagattg ttcatactgc ccacagtctt caagatacag taccggattg aaggctgaaa 420  
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 agcaagccgc ttcgatgtaa aatgttggtg tagattctcg agaccacatc cggtgcaaaa 1260  
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<210> 18  
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 <212> PRT  
 <213> Hordeum vulgare

<400> 18  
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 35 40 45  
 Ala Pro Phe Ser Ser Val Ser Ala Ala Ala Ala Glu Ala Glu Arg Ala  
 50 55 60  
 Val Arg Asp Gly Pro Arg Asn Asp Trp Thr Arg Pro Glu Ile Gln Ala  
 65 70 75 80  
 Ile Tyr Asp Ser Pro Leu Leu Asp Leu Leu Phe His Gly Ala Gln Val  
 85 90 95  
 His Arg Asn Val His Lys Phe Arg Glu Val Gln Gln Cys Thr Leu Leu  
 100 105 110  
 Ser Ile Lys Thr Gly Gly Cys Ser Glu Asp Cys Ser Tyr Cys Pro Gln  
 115 120 125

Ser Ser Arg Tyr Ser Thr Gly Leu Lys Ala Glu Lys Leu Met Lys Lys  
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 Asp Ala Val Leu Glu Ala Ala Lys Lys Ala Lys Glu Ala Gly Ser Thr  
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 Arg Phe Cys Met Gly Ala Ala Trp Arg Glu Thr Ile Gly Arg Lys Thr  
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 Asn Phe Asn Gln Ile Leu Glu Tyr Val Lys Asp Ile Arg Gly Met Gly  
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 Met Glu Val Cys Cys Thr Leu Gly Met Leu Glu Lys Gln Ala Glu  
 195 200 205  
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 Ser Arg Glu Tyr Tyr Pro Asn Ile Ile Ser Thr Arg Ser Tyr Asp Asp  
 225 230 235 240  
 Arg Leu Gln Thr Leu Gln His Val Arg Glu Ala Gly Ile Ser Val Cys  
 245 250 255  
 Ser Gly Gly Ile Ile Gly Leu Gly Glu Ala Glu Glu Asp Arg Val Gly  
 260 265 270  
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 Ile Asn Ala Leu Ile Ala Val Lys Gly Thr Pro Leu Gln Asp Gln Lys  
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 Pro Val Glu Ile Trp Glu Met Ile Arg Met Ile Ala Ser Ala Arg Ile  
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 Val Met Pro Lys Ala Met Val Arg Leu Ser Ala Gly Arg Val Arg Phe  
 325 330 335  
 Ser Met Pro Glu Gln Ala Leu Cys Phe Leu Ala Gly Ala Asn Ser Ile  
 340 345 350  
 Phe Ala Gly Glu Lys Leu Leu Thr Thr Ala Asn Asn Asp Phe Asp Ala  
 355 360 365  
 Asp Gln Ala Met Phe Lys Ile Leu Gly Leu Ile Pro Lys Ala Pro Asn  
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 <211> 1467  
 <212> DNA  
 <213> Zea mays

<400> 19  
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 cgcccgtgct tcctctatcc ctttcctgct gctgctacta ccttaagcta tcaactatcat 180  
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 cgactggagc cgccccgaga tccaggccgt ctacgactca ccgtctctcg acctcctctt 360  
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 gggagctgca tggagagaaa ccattggcag gaaatcaaac ttcaaccaga ttcttgaata 540  
 tgtcaaggaa ataaggggta tgggcatgga ggtctgttgc aactaggcga tgatagagaa 600  
 acaacaagct gaagaactca agaaggctgg acttacagca tataatcata acctagatac 660  
 atcaagagag tattatccca acattattac cacaagatca tatgatgata gactgcagac 720

|            |            |            |            |            |            |      |
|------------|------------|------------|------------|------------|------------|------|
| tcttgagcat | gtccgtgaag | ctggaataag | catctgctca | ggtggaatca | ttggtcttgg | 780  |
| tgaagcagag | gaggaccggg | taggggttgt | gcatacccta | gctacccttg | ctacacaccc | 840  |
| agagagcggt | cctattaatg | cattgggttg | tgtaaaaggc | acacctcttg | aggaccagaa | 900  |
| gcctgtagag | atctgggaaa | tgatccgcat | gatcgccact | gctcggatca | cgatgccaaa | 960  |
| ggcaatggtg | aggctttcag | caggccgagt | acggttctcg | atgccagaac | aagcgctgtg | 1020 |
| cttctcgcgt | ggggccaact | ccatctttgc | cggcgagaaa | cttctcacia | ccgcaaacia | 1080 |
| cgactttgat | gcgagaccag | cgatgttcaa | gatccttggc | ctgatcccca | aggctccaag | 1140 |
| ctttggcgag | gaagaggcgt | ctgcggcggc | tcccacagaa | tccgagaggt | ctgagcaagc | 1200 |
| tgcttcgatg | tagaatatat | acatatcatt | accgattatc | cgtatcacgg | ttggggcgaa | 1260 |
| actagaacta | ccgttgtagc | tagagcattg | gattgtagaa | accacaacat | ttcattattt | 1320 |
| tgtaattgct | tgagactgaa | tgggggatac | ccatgtcggg | ctagatcaat | ggacaacttc | 1380 |
| cacacaacca | aatccaaaca | ttgaaactca | tttttcatca | cagttttaat | aaacttctcc | 1440 |
| cacttatctt | aaaaaaaaaa | aaaaaaa    |            |            |            | 1467 |

<210> 20  
 <211> 344  
 <212> PRT  
 <213> Zea mays

<400> 20

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Leu | Met | Leu | Leu | Ala | Arg | Asn | Leu | Arg | Ser | Arg | Leu | Arg | Pro |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Pro | Leu | Ala | Ala | Ala | Ala | Ala | Phe | Ser | Ser | Ala | Ala | Ala | Glu | Ala | Glu |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Ala | Ile | Arg | Asp | Gly | Pro | Arg | Asn | Asp | Trp | Ser | Arg | Pro | Glu | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gln | Ala | Val | Tyr | Asp | Ser | Pro | Leu | Leu | Asp | Leu | Leu | Phe | His | Gly | Ala |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Gln | Ser | Ser | Arg | Tyr | Asn | Thr | Gly | Leu | Lys | Ala | Gln | Lys | Leu | Met | Asn |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Lys | Tyr | Ala | Val | Leu | Glu | Ala | Ala | Lys | Lys | Ala | Lys | Glu | Ser | Gly | Ser |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Thr | Arg | Phe | Cys | Met | Gly | Ala | Ala | Trp | Arg | Glu | Thr | Ile | Gly | Arg | Lys |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ser | Asn | Phe | Asn | Gln | Ile | Leu | Glu | Tyr | Val | Lys | Glu | Ile | Arg | Gly | Met |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Gly | Met | Glu | Val | Cys | Cys | Thr | Leu | Gly | Met | Ile | Glu | Lys | Gln | Gln | Ala |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Glu | Glu | Leu | Lys | Lys | Ala | Gly | Leu | Thr | Ala | Tyr | Asn | His | Asn | Leu | Asp |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Thr | Ser | Arg | Glu | Tyr | Tyr | Pro | Asn | Ile | Ile | Thr | Thr | Arg | Ser | Tyr | Asp |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Asp | Arg | Leu | Gln | Thr | Leu | Glu | His | Val | Arg | Glu | Ala | Gly | Ile | Ser | Ile |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Cys | Ser | Gly | Gly | Ile | Ile | Gly | Leu | Gly | Glu | Ala | Glu | Glu | Asp | Arg | Val |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Gly | Leu | Leu | His | Thr | Leu | Ala | Thr | Leu | Pro | Thr | His | Pro | Glu | Ser | Val |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Pro | Ile | Asn | Ala | Leu | Val | Ala | Val | Lys | Gly | Thr | Pro | Leu | Glu | Asp | Gln |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |
| Lys | Pro | Val | Glu | Ile | Trp | Glu | Met | Ile | Arg | Met | Ile | Ala | Thr | Ala | Arg |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |
| Ile | Thr | Met | Pro | Lys | Ala | Met | Val | Arg | Leu | Ser | Ala | Gly | Arg | Val | Arg |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Phe | Ser | Met | Pro | Glu | Gln | Ala | Leu | Cys | Phe | Leu | Ala | Gly | Ala | Asn | Ser |







|             |             |            |            |             |            |      |
|-------------|-------------|------------|------------|-------------|------------|------|
| ggggctcagg  | tccacagaaa  | tgtccataaa | ttcagagaag | tgcagcaatg  | cacacttctt | 360  |
| tcaatcaaga  | ctggtgatg   | cagtgaagat | tgttcttact | gtcctcagtc  | atcaagatac | 420  |
| aacactggat  | tgaaggccca  | aaaattgatg | aacaaatatg | ctgtcttgga  | agcagcaaaa | 480  |
| aaggcaaaag  | agtctgggag  | cacccgtttt | tgcattggag | ctgcattggag | agaaaccatt | 540  |
| ggcaggaaat  | caaacttcaa  | ccagattctt | gaatatgtca | aggaaataag  | gggtatgggc | 600  |
| atggagggtct | gttgcacact  | aggcatgata | gagaaacaac | aagctgaaga  | actcaagaag | 660  |
| gctggactta  | cagcatataa  | tcataaccta | gatacatcaa | gagagtatta  | tcccaacatt | 720  |
| attaccacaa  | gatcatatga  | tgatagactg | cagactcttg | agcatgtccg  | tgaagcttga | 780  |
| ataagcatct  | gctcaggttg  | aatcattggt | cttggtagag | cagaggagga  | ccgggtaggg | 840  |
| ttgttgcata  | ccctagctac  | cttgctaca  | caccagaga  | gcgttcttat  | taatgcattg | 900  |
| gttgctgtaa  | aaggcacacc  | tcttgaggac | cagaagcctg | tagagatctg  | ggaaatgatc | 960  |
| cgcatgatcg  | ccactgctcg  | gatcacgatg | ccaaaggcaa | tggtgaggct  | ttcagcaggc | 1020 |
| cgagtacggt  | tctcgatgcc  | agaacaagcg | ctgtgcttcc | tcgctggggc  | caactccatc | 1080 |
| tttgccggcg  | agaaacttct  | cacaaccgca | aacaacgact | ttgatgcgga  | ccaggcgatg | 1140 |
| ttcaagatcc  | ttggcctgat  | ccccagggt  | ccaagctttg | gcgaggaaga  | ggcgtctgcg | 1200 |
| gcggctccca  | cagaatccga  | gagggtctgg | caagctgctt | cgatgtagaa  | tatatacata | 1260 |
| tcattaccga  | ttaatccgat  | cacggttggg | gcgaaactag | aactaccgtt  | gtagctagag | 1320 |
| cattggattg  | tagaaaaccac | aacatttcat | tattttgtaa | ttgcttgaga  | ctgaatgggg | 1380 |
| gatacccatg  | tcgggctaga  | tcaatggaca | acttccacac | aaaaaaaaaa  | aaaaaaaaaa | 1439 |

|       |          |
|-------|----------|
| <210> | 24       |
| <211> | 377      |
| <212> | PRT      |
| <213> | Zea mays |

<400> 24

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Leu | Met | Leu | Leu | Ala | Arg | Asn | Leu | Arg | Ser | Arg | Leu | Arg | Pro |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Pro | Leu | Ala | Ala | Ala | Ala | Ala | Phe | Ser | Ser | Ala | Ala | Ala | Glu | Ala | Glu |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Ala | Ile | Arg | Asp | Gly | Pro | Arg | Asn | Asp | Trp | Ser | Arg | Pro | Glu | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gln | Ala | Val | Tyr | Asp | Ser | Pro | Leu | Leu | Asp | Leu | Leu | Phe | His | Gly | Ala |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Gln | Val | His | Arg | Asn | Val | His | Lys | Phe | Arg | Glu | Val | Gln | Gln | Cys | Thr |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Leu | Leu | Ser | Ile | Lys | Thr | Gly | Gly | Cys | Ser | Glu | Asp | Cys | Ser | Tyr | Cys |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Pro | Gln | Ser | Ser | Arg | Tyr | Asn | Thr | Gly | Leu | Lys | Ala | Gln | Lys | Leu | Met |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     | 110 |     |     |     |
| Asn | Lys | Tyr | Ala | Val | Leu | Glu | Ala | Ala | Lys | Lys | Ala | Lys | Glu | Ser | Gly |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ser | Thr | Arg | Phe | Cys | Met | Gly | Ala | Ala | Trp | Arg | Glu | Thr | Ile | Gly | Arg |
|     | 130 |     |     |     |     | 135 |     |     |     | 140 |     |     |     |     |     |
| Lys | Ser | Asn | Phe | Asn | Gln | Ile | Leu | Glu | Tyr | Val | Lys | Glu | Ile | Arg | Gly |
| 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |     |
| Met | Gly | Met | Glu | Val | Cys | Cys | Thr | Leu | Gly | Met | Ile | Glu | Lys | Gln | Gln |
|     |     |     |     | 165 |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Ala | Glu | Glu | Leu | Lys | Lys | Ala | Gly | Leu | Thr | Ala | Tyr | Asn | His | Asn | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     | 190 |     |     |     |
| Asp | Thr | Ser | Arg | Glu | Tyr | Tyr | Pro | Asn | Ile | Ile | Thr | Thr | Arg | Ser | Tyr |
|     |     | 195 |     |     |     |     | 200 |     |     |     | 205 |     |     |     |     |
| Asp | Asp | Arg | Leu | Gln | Thr | Leu | Glu | His | Val | Arg | Glu | Ala | Gly | Ile | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     | 220 |     |     |     |     |     |
| Ile | Cys | Ser | Gly | Gly | Ile | Ile | Gly | Leu | Gly | Glu | Ala | Glu | Glu | Asp | Arg |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |
| Val | Gly | Leu | Leu | His | Thr | Leu | Ala | Thr | Leu | Pro | Thr | His | Pro | Glu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     | 255 |     |
| Val | Pro | Ile | Asn | Ala | Leu | Val | Ala | Val | Lys | Gly | Thr | Pro | Leu | Glu |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 | Asp |
| Gln | Lys | Pro | Val | Glu | Ile | Trp | Glu | Met | Ile | Arg | Met | Ile | Ala | Thr |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     | Ala |
| Arg | Ile | Thr | Met | Pro | Lys | Ala | Met | Val | Arg | Leu | Ser | Ala | Gly | Arg |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     | Val |
| Arg | Phe | Ser | Met | Pro | Glu | Gln | Ala | Leu | Cys | Phe | Leu | Ala | Gly | Ala |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | Asn |
| Ser | Ile | Phe | Ala | Gly | Glu | Lys | Leu | Leu | Thr | Thr | Ala | Asn | Asn | Asp |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | Phe |
| Asp | Ala | Asp | Gln | Ala | Met | Phe | Lys | Ile | Leu | Gly | Leu | Ile | Pro | Lys |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 | Ala |
| Pro | Ser | Phe | Gly | Glu | Glu | Glu | Ala | Ser | Ala | Ala | Ala | Pro | Thr | Glu |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     | Ser |
| Glu | Arg | Ser | Glu | Gln | Ala | Ala | Ser | Met |     |     |     |     |     |     |
|     | 370 |     |     |     |     | 375 |     |     |     |     |     |     |     |     |

<210> 25  
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 <212> DNA  
 <213> Argemone mexicana

|            |            |            |            |            |             |  |  |  |  |  |  |  |  |  |  |  |  |  |      |
|------------|------------|------------|------------|------------|-------------|--|--|--|--|--|--|--|--|--|--|--|--|--|------|
| <400> 25   |            |            |            |            |             |  |  |  |  |  |  |  |  |  |  |  |  |  |      |
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| cactcgaagc | ttcatcaata | gaaatatcat | aaacagaaga | attcaaaatg | cttaaagtgc  |  |  |  |  |  |  |  |  |  |  |  |  |  | 120  |
| aatctttgag | agctcgctct | cgacctttga | ttttcatttc | tacattttct | tctctctcat  |  |  |  |  |  |  |  |  |  |  |  |  |  | 180  |
| catcttcttc | ttcttcagct | gctgctgttc | aagcagaaag | aacgattaaa | gaaggtccaa  |  |  |  |  |  |  |  |  |  |  |  |  |  | 240  |
| gaaacgattg | gagcagagat | gaaattaaat | cggtttatga | ttctccagtt | ctcgatcttc  |  |  |  |  |  |  |  |  |  |  |  |  |  | 300  |
| tcttccatgc | agctcaagtc | catagacatg | ctcacaactt | caggggaagt | cagcaatgta  |  |  |  |  |  |  |  |  |  |  |  |  |  | 360  |
| ctcttctctc | tgttaagaca | ggtgggtgca | gtgaagattg | ttcatattgt | ccacaatctt  |  |  |  |  |  |  |  |  |  |  |  |  |  | 420  |
| ccaggtatga | cactggagtg | aaagcccaaa | agctgatgaa | caaggacgca | gttctgcagg  |  |  |  |  |  |  |  |  |  |  |  |  |  | 480  |
| cagcagaaaa | ggcaaaggag | gcgggtagta | cacgtttctg | catgggtgct | gcatggagag  |  |  |  |  |  |  |  |  |  |  |  |  |  | 540  |
| atacagtggg | caggaagacc | aacttcaaac | agatcctcga | atatgtaaaa | gaaattcggg  |  |  |  |  |  |  |  |  |  |  |  |  |  | 600  |
| gtatgggaat | ggaggtatgc | tgcactttag | gcatgatcga | gaagcagcaa | gctgtggaac  |  |  |  |  |  |  |  |  |  |  |  |  |  | 660  |
| tcaagcaggc | tgggctcaca | gcttacaatc | ataatcttga | tacttcaaga | gagtattacc  |  |  |  |  |  |  |  |  |  |  |  |  |  | 720  |
| ctaacatcat | caccacaaga | tcttacgatg | agcgtttgga | aactcttcag | ttcgtccggg  |  |  |  |  |  |  |  |  |  |  |  |  |  | 780  |
| aagcagggat | caatgtctgc | tcaggaggaa | taatagggct | aggagaagca | gaggaggatc  |  |  |  |  |  |  |  |  |  |  |  |  |  | 840  |
| gagttgggtc | tttgcataca | ctagcaacgc | ttccttcaca | tccagaaagt | gttcccatca  |  |  |  |  |  |  |  |  |  |  |  |  |  | 900  |
| atgcattgct | tgcagtcaaa | ggcacacctc | ttgaagatca | gaagccagtt | gaaatatggg  |  |  |  |  |  |  |  |  |  |  |  |  |  | 960  |
| agatgattcg | gatgattgct | actgctagaa | ttgtaatgcc | aaaagcaatg | gtcaggctat  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1020 |
| cagcaggtcg | tgttcgattt | tccatgtccg | agcaagctct | ctgcttcctt | gctggcgcca  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1080 |
| attccatctt | cactggtgag | aaactattga | caactcccaa | caatgatttt | gacgcagatc  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1140 |
| aaatgatgtt | taagatttta | gggctgacac | caaaagctcc | aaattttgac | caaacatcaa  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1200 |
| catctttcga | agccgagaga | tgtgaacaag | aagcaactgc | gtcatagttc | ttgcttcgat  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1260 |
| gagattatat | atztatccaa | atgaagaaat | tcccgtccac | cgtgtaagct | tctttctttt  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1320 |
| acatgaagtt | tctttgtatg | aattatgaaa | cctccaaaat | aagctatact | atztatataca |  |  |  |  |  |  |  |  |  |  |  |  |  | 1380 |
| ggaagttact | gctaaatttt | caattccatg | ggaaatctat | tttatgaact | caaaaaaaaaa |  |  |  |  |  |  |  |  |  |  |  |  |  | 1440 |
| aaaaaaaaaa | aaaaaaaaaa | aaaaaaaaaa | aaaaaaa    |            |             |  |  |  |  |  |  |  |  |  |  |  |  |  | 1477 |

<210> 26  
 <211> 379

<212> PRT  
 <213> Argemone mexicana

<400> 26

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Lys | Val | Gln | Ser | Leu | Arg | Ala | Arg | Leu | Arg | Pro | Leu | Ile | Phe |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ile | Ser | Thr | Phe | Ser | Ser | Leu | Ser | Ser | Ser | Ser | Ser | Ser | Ser | Ala | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Val | Gln | Ala | Glu | Arg | Thr | Ile | Lys | Glu | Gly | Pro | Arg | Asn | Asp | Trp |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ser | Arg | Asp | Glu | Ile | Lys | Ser | Val | Tyr | Asp | Ser | Pro | Val | Leu | Asp | Leu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Leu | Phe | His | Ala | Ala | Gln | Val | His | Arg | His | Ala | His | Asn | Phe | Arg | Glu |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Val | Gln | Gln | Cys | Thr | Leu | Leu | Ser | Val | Lys | Thr | Gly | Gly | Cys | Ser | Glu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Asp | Cys | Ser | Tyr | Cys | Pro | Gln | Ser | Ser | Arg | Tyr | Asp | Thr | Gly | Val | Lys |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Gln | Lys | Leu | Met | Asn | Lys | Asp | Ala | Val | Leu | Gln | Ala | Ala | Glu | Lys |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ala | Lys | Glu | Ala | Gly | Ser | Thr | Arg | Phe | Cys | Met | Gly | Ala | Ala | Trp | Arg |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asp | Thr | Val | Gly | Arg | Lys | Thr | Asn | Phe | Lys | Gln | Ile | Leu | Glu | Tyr | Val |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Lys | Glu | Ile | Arg | Gly | Met | Gly | Met | Glu | Val | Cys | Cys | Thr | Leu | Gly | Met |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ile | Glu | Lys | Gln | Ala | Val | Glu | Leu | Lys | Gln | Ala | Gly | Leu | Thr | Ala |     |
|     |     |     | 180 |     |     |     | 185 |     |     |     |     | 190 |     |     |     |
| Tyr | Asn | His | Asn | Leu | Asp | Thr | Ser | Arg | Glu | Tyr | Tyr | Pro | Asn | Ile | Ile |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Thr | Arg | Ser | Tyr | Asp | Glu | Arg | Leu | Glu | Thr | Leu | Gln | Phe | Val | Arg |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Glu | Ala | Gly | Ile | Asn | Val | Cys | Ser | Gly | Gly | Ile | Ile | Gly | Leu | Gly | Glu |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ala | Glu | Glu | Asp | Arg | Val | Gly | Leu | Leu | His | Thr | Leu | Ala | Thr | Leu | Pro |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | His | Pro | Glu | Ser | Val | Pro | Ile | Asn | Ala | Leu | Leu | Ala | Val | Lys | Gly |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Thr | Pro | Leu | Glu | Asp | Gln | Lys | Pro | Val | Glu | Ile | Trp | Glu | Met | Ile | Arg |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Met | Ile | Ala | Thr | Ala | Arg | Ile | Val | Met | Pro | Lys | Ala | Met | Val | Arg | Leu |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ser | Ala | Gly | Arg | Val | Arg | Phe | Ser | Met | Ser | Glu | Gln | Ala | Leu | Cys | Phe |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Leu | Ala | Gly | Ala | Asn | Ser | Ile | Phe | Thr | Gly | Glu | Lys | Leu | Leu | Thr | Thr |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Pro | Asn | Asn | Asp | Phe | Asp | Ala | Asp | Gln | Met | Met | Phe | Lys | Ile | Leu | Gly |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Leu | Thr | Pro | Lys | Ala | Pro | Asn | Phe | Asp | Gln | Thr | Ser | Thr | Ser | Phe | Glu |
|     | 355 |     |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Ala | Glu | Arg | Cys | Glu | Gln | Glu | Ala | Thr | Ala | Ser |     |     |     |     |     |
|     | 370 |     |     |     |     | 375 |     |     |     |     |     |     |     |     |     |

<210> 27  
 <211> 1526



<212> DNA  
<213> Glycine max

<400> 27  
gcacgagcta gtactgctcc ctctgcgact tcgtttcgta gagggatttt ggccgcaaaa 60  
taaacagtct caccataaac tccaaagtc caacgctaaa cgaaacccaa ccccaaacac 120  
aaataccgtt gttgtctgtt gtctctgtcg tgtctatatt cgcagatctc tcaactcattc 180  
tctgttgttt ctctgccccaa ctctcgaattc gaaagcaaaa acatgttttt ggcgagacccc 240  
attttccgag caccctccct ttgggcgttg cactcttcct acgcgtattc ctctgcctca 300  
gcagctgcaa ttcaagctga gagagccatc aaagaaggac ccagaaaacga ttggagccga 360  
gaccaagtca aatccatcta cgactctccc attctcgatc ttctcttcca tggggctcaa 420  
gttcacagac atgctcataa cttcagggaa gttcagcagt gtactcttct gtctatcaaa 480  
acaggagggt gcagtgaaga ttgttcctat tgtcctcaat cctctaagta tgatacagga 540  
gtcaaaggcc aacgccttat gaacaaggaa gctgttctac aggctgcaaa gaaggcaaaa 600  
gaggctggga gcactcgctt ttgtatgggt gctgcatgga gggatacact gggaagaaag 660  
accaacttca aocagatcct tgaatatgtg aaagacataa gggacatggg aatggaggtt 720  
tggtgcaccc ttggcatgct ggagaaacag caggctgttg aactcaagaa ggcaggtctc 780  
actgcctata atcacaatct tgacacttca agggagtatt atccaaacat catcacaaca 840  
aggacttatg atgagcgtct tcaaaccctt gagtttggtc gtgatgcagg gatcaatgtt 900  
tgttctggag gaattatagg gcttggagaa gcagaggagg atcgtgtagg ttgtttacat 960  
acattgtcaa cacttcccac ccatccagag agtgttccta ttaatgcaat tggtgctgta 1020  
aagggaaccc ctcttgagga tcagaagcct gttgaaatat gggagatgat tcgcatgata 1080  
gcaactgcac gtatcgtaat gccaaaagca atggtcaggt tatcagctgg cagagttcga 1140  
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gaaaagcttc tcaactactcc taacaatgat tttgatgctg atcaactcat gtttaaagtt 1260  
cttggacttc tcccaaaaagc tccaagctta catgaagggt aaactagtgt gacagaagat 1320  
tataaggaag cagcttcttc tagttgagtt gtcaacggtt tcaaaacaat atctgtgatc 1380  
cttcaacttc tctaattgct cattagcatg tactgatgtt aggtttcatt gaatttgtct 1440  
aatctcagct ttgaagcac aaactccaac acttaaaaat aaatattgaa attattgatt 1500  
tttccctaaa aaaaaaaaaa aaaaaa 1526

<210> 28  
<211> 415  
<212> PRT  
<213> Glycine max

<400> 28  
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1 5 10 15  
Ser Cys Leu Tyr Ser Gln Ile Ser His Ser Phe Ser Val Val Ser Leu  
20 25 30  
Pro Asn Phe Glu Phe Glu Ser Lys Asn Met Phe Leu Ala Arg Pro Ile  
35 40 45  
Phe Arg Ala Pro Ser Leu Trp Ala Leu His Ser Ser Tyr Ala Tyr Ser  
50 55 60  
Ser Ala Ser Ala Ala Ala Ile Gln Ala Glu Arg Ala Ile Lys Glu Gly  
65 70 75 80  
Pro Arg Asn Asp Trp Ser Arg Asp Gln Val Lys Ser Ile Tyr Asp Ser  
85 90 95  
Pro Ile Leu Asp Leu Leu Phe His Gly Ala Gln Val His Arg His Ala  
100 105 110  
His Asn Phe Arg Glu Val Gln Gln Cys Thr Leu Leu Ser Ile Lys Thr  
115 120 125  
Gly Gly Cys Ser Glu Asp Cys Ser Tyr Cys Pro Gln Ser Ser Lys Tyr  
130 135 140

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Thr | Gly | Val | Lys | Gly | Gln | Arg | Leu | Met | Asn | Lys | Glu | Ala | Val | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Gln | Ala | Ala | Lys | Lys | Ala | Lys | Glu | Ala | Gly | Ser | Thr | Arg | Phe | Cys | Met |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Ala | Ala | Trp | Arg | Asp | Thr | Leu | Gly | Arg | Lys | Thr | Asn | Phe | Asn | Gln |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ile | Leu | Glu | Tyr | Val | Lys | Asp | Ile | Arg | Asp | Met | Gly | Met | Glu | Val | Cys |
|     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |
| Cys | Thr | Leu | Gly | Met | Leu | Glu | Lys | Gln | Gln | Ala | Val | Glu | Leu | Lys | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ala | Gly | Leu | Thr | Ala | Tyr | Asn | His | Asn | Leu | Asp | Thr | Ser | Arg | Glu | Tyr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Pro | Asn | Ile | Ile | Thr | Thr | Arg | Thr | Tyr | Asp | Glu | Arg | Leu | Gln | Thr |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Leu | Glu | Phe | Val | Arg | Asp | Ala | Gly | Ile | Asn | Val | Cys | Ser | Gly | Gly | Ile |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ile | Gly | Leu | Gly | Glu | Ala | Glu | Glu | Asp | Arg | Val | Gly | Leu | Leu | His | Thr |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Leu | Ser | Thr | Leu | Pro | Thr | His | Pro | Glu | Ser | Val | Pro | Ile | Asn | Ala | Leu |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Val | Ala | Val | Lys | Gly | Thr | Pro | Leu | Glu | Asp | Gln | Lys | Pro | Val | Glu | Ile |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Trp | Glu | Met | Ile | Arg | Met | Ile | Ala | Thr | Ala | Arg | Ile | Val | Met | Pro | Lys |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ala | Met | Val | Arg | Leu | Ser | Ala | Gly | Arg | Val | Arg | Phe | Ser | Met | Pro | Glu |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Gln | Ala | Leu | Cys | Phe | Leu | Ala | Gly | Ala | Asn | Ser | Ile | Phe | Thr | Gly | Glu |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Lys | Leu | Leu | Thr | Thr | Pro | Asn | Asn | Asp | Phe | Asp | Ala | Asp | Gln | Leu | Met |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Phe | Lys | Val | Leu | Gly | Leu | Leu | Pro | Lys | Ala | Pro | Ser | Leu | His | Glu | Gly |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Thr | Ser | Val | Thr | Glu | Asp | Tyr | Lys | Glu | Ala | Ala | Ser | Ser | Ser |     |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     |     | 415 |     |

<210> 29  
 <211> 1659  
 <212> DNA  
 <213> Glycine max

|   |     |
|---|-----|
| <400> 29  |     |
| aaagagtgtatacagatagattttccaaactccactcactcaccactatggcgactctcag       | 60  |
| aacttccctatcacgatccc tcatcctccttcgctccaat acccctaatac tgcacctat     | 120 |
| ctcttctctgttctgtcttaagttcaaaa gtcgagaaac tatggtaccg tatcatctgt      | 180 |
| tcctcctcaa gctacagaaa catcaagcac atcacctagt aaggatgtct accaagaagc   | 240 |
| actcaacgca actgaacccc gcagcaattg gacaagagaa gaaatcaagg cgatctatga   | 300 |
| taagccattg atggagttat gttgggggtgc tggtagtttg cacaggaaat tccatatacc  | 360 |
| tggggctatt cagatgtgta cattgttgaa catcaagacg ggtggttgct cggaggattg   | 420 |
| ttcttactgc gcccaatcat cccgctacca aaccggtctc aaagcctcca aaatggtctc   | 480 |
| cgtcgaatct gtcctcgcag ccgcccgcac cgccaaagac aacggtagta cacgtttctg   | 540 |
| catgggagcc gcgtggcgcg atatgcgtgg acgaaaaacc aatctcaaaa atgtcaaaac   | 600 |
| aatggttagc gagattcgcg gaatgggtat ggaagtatgt gtcacgcttg gtatgattga   | 660 |
| tgcagagcaa gctcaggaac tcaaagaagc cgggtctcacg gcttataatc ataattgtgga | 720 |
| tacgtcgagg gatttctatc ccaagggttat cagcaccagg acttatgatg agagattgga  | 780 |
| taccattaag aatgtgagag aggccggaat caatgtttgt acgggtggaa tcctcgatt    | 840 |

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aggagaaaaat aagtctgacc atattggact tttggagacg gttgctacgt tgccttcgca 900
tccggaatca tttcctgtga acatgttagt ggctatcaaa ggaacaccac tgggaaggaaa 960
caagaagggtg gaatttgaga atatgttgag aatgggtgcg acggctagaa tcgtcatgcc 1020
taaaaccatc gtgcgttttg cagctggaag aggagaattg agcgaggaac aacaggctctt 1080
atgtttcatg gccggagcca atgccgtttt cacaggagaa acaatgttaa ccacaccagc 1140
cgttggatgg ggtgtcgatt ccgtcgtttt caacagatgg ggattaagac ccatggaaaag 1200
tttcgaggtt gaagccttga agaacgataa acctgccact actaatacgg aaataccggt 1260
agaggcaagt aaggcagaga tgccaggtag agttgcttga ttgattgttt gatttggata 1320
cccagggcgt ttggtgcgct catcatctcg agtttttgca aggagattcg aacagtggaa 1380
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tgttttgcgc tatcgtgtgt tgtcatctcg tgggaattta gcgttggttg ttttggtttt 1500
ggttttgttt gatgtgagag aatgattgtt tagaagggga gaatgtatat acggaacagt 1560
agaatatatt cttgtctata agattatata ggataaatat atataagctt atcctcaaaa 1620
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1659

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<210> 30
<211> 417
<212> PRT
<213> Glycine max

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Ser Asn Thr Pro Lys Leu Ala Pro Ile Ser Ser Ser Val Arg Leu Gln
20 25 30
Val Gln Lys Ser Arg Asn Tyr Gly Thr Val Ser Ser Val Pro Pro Gln
35 40 45
Ala Thr Glu Thr Ser Ser Thr Ser Pro Ser Lys Asp Val Tyr Gln Glu
50 55 60
Ala Leu Asn Ala Thr Glu Pro Arg Ser Asn Trp Thr Arg Glu Glu Ile
65 70 75 80
Lys Ala Ile Tyr Asp Lys Pro Leu Met Glu Leu Cys Trp Gly Ala Gly
85 90 95
Ser Leu His Arg Lys Phe His Ile Pro Gly Ala Ile Gln Met Cys Thr
100 105 110
Leu Leu Asn Ile Lys Thr Gly Gly Cys Ser Glu Asp Cys Ser Tyr Cys
115 120 125
Ala Gln Ser Ser Arg Tyr Gln Thr Gly Leu Lys Ala Ser Lys Met Val
130 135 140
Ser Val Glu Ser Val Leu Ala Ala Ala Arg Ile Ala Lys Asp Asn Gly
145 150 155 160
Ser Thr Arg Phe Cys Met Gly Ala Ala Trp Arg Asp Met Arg Gly Arg
165 170 175
Lys Thr Asn Leu Lys Asn Val Lys Thr Met Val Ser Glu Ile Arg Gly
180 185 190
Met Gly Met Glu Val Cys Val Thr Leu Gly Met Ile Asp Ala Glu Gln
195 200 205
Ala Gln Glu Leu Lys Glu Ala Gly Leu Thr Ala Tyr Asn His Asn Val
210 215 220
Asp Thr Ser Arg Asp Phe Tyr Pro Lys Val Ile Thr Thr Arg Thr Tyr
225 230 235 240
Asp Glu Arg Leu Asp Thr Ile Lys Asn Val Arg Glu Ala Gly Ile Asn
245 250 255
Val Cys Thr Gly Gly Ile Leu Gly Leu Gly Glu Asn Lys Ser Asp His
260 265 270

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Ile Gly Leu Leu Glu Thr Val Ala Thr Leu Pro Ser His Pro Glu Ser  
 275 280 285  
 Phe Pro Val Asn Met Leu Val Ala Ile Lys Gly Thr Pro Leu Glu Gly  
 290 295 300  
 Asn Lys Lys Val Glu Phe Glu Asn Met Leu Arg Met Val Ala Thr Ala  
 305 310 315 320  
 Arg Ile Val Met Pro Lys Thr Ile Val Arg Leu Ala Ala Gly Arg Gly  
 325 330 335  
 Glu Leu Ser Glu Glu Gln Gln Val Leu Cys Phe Met Ala Gly Ala Asn  
 340 345 350  
 Ala Val Phe Thr Gly Glu Thr Met Leu Thr Thr Pro Ala Val Gly Trp  
 355 360 365  
 Gly Val Asp Ser Val Val Phe Asn Arg Trp Gly Leu Arg Pro Met Glu  
 370 375 380  
 Ser Phe Glu Val Glu Ala Leu Lys Asn Asp Lys Pro Ala Thr Thr Asn  
 385 390 395 400  
 Thr Glu Ile Pro Val Glu Ala Ser Lys Ala Glu Met Pro Gly Thr Val  
 405 410 415  
 Ala

<210> 31  
 <211> 1032  
 <212> DNA  
 <213> Triticum aestivum

<400> 31  
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 tttgcatggg agccgcatgg agagagacaa ttggcaggaa aacaaatttc aaccagattc 120  
 ttgaatatgt caaggacata agaggtatgg gcatggaggt ctgttgacc ctgggcatgc 180  
 tagagaaaca acaagctgaa gaactcaaga aggctggact tacagcttat aatcataacc 240  
 tagatacatc aagagaatat taccccaaca ttatttctac aagatcgtag gatgatagat 300  
 tacagactct tcagcatgtc cgtgaagctg gaataagcgt ctgctcaggt ggaattattg 360  
 gtcttggaga ggcggaggaa gaccgtgtag ggctgttgca tacactggcc actttgcaa 420  
 cacaccaga gagcgttcct atcaatgcat tgattgctgt caaaggcacg cctcttcagg 480  
 atcagaagcc tgtagagata tgggaaatga tccgcatgat tgccagcgca cggattgtga 540  
 tgccaaaggc aatggtgaga ctttcggcag ggagagtacg gttttccatg ccagaacaag 600  
 ctctctgctt tctcgttggg gccaaactcga tcttcgccgg tgaaaagctc ctgacaactg 660  
 cgaacaatga cttttagatgc gaccaggcaa tgttcaagat ccttggcctg attcccaagg 720  
 ctccaaactt tggcgatgaa gaggtcatgg tagcagcacc cacggagaga tgtgagcaag 780  
 ccgctttgat gtaaaatgtc ggtatagatt ctcgagacca catccggtgc aaaactggca 840  
 ccattatctc cacctagagt tttgtactgt agagatcatg acattttata gtaacttcag 900  
 attcatcgaa ataaaaatagg gggttctctg caaaaaaaaa aaaaaaaaaa aaaaaaaaaa 960  
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1020  
 aaaaaaaaaa aa 1032

<210> 32  
 <211> 263  
 <212> PRT  
 <213> Triticum aestivum

<400> 32  
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Ala Lys Glu Ala Gly Ser Thr Arg Phe Cys Met Gly Ala Ala Trp Arg  
 130 135 140  
 Asp Thr Ile Gly Arg Lys Thr Asn Phe Ser Gln Ile Leu Glu Tyr Ile  
 145 150 155 160  
 Lys Glu Ile Arg Gly Met Gly Met Glu Val Cys Cys Thr Leu Gly Met  
 165 170 175  
 Ile Glu Lys Gln Gln Ala Leu Glu Leu Lys Lys Ala Gly Leu Thr Ala  
 180 185 190  
 Tyr Asn His Asn Leu Asp Thr Ser Arg Glu Tyr Tyr Pro Asn Val Ile  
 195 200 205  
 Thr Thr Arg Ser Tyr Asp Asp Arg Leu Glu Thr Leu Ser His Val Arg  
 210 215 220  
 Asp Ala Gly Ile Asn Val Cys Ser Gly Gly Ile Ile Gly Leu Gly Glu  
 225 230 235 240  
 Ala Glu Glu Asp Arg Ile Gly Leu Leu His Thr Leu Ala Thr Leu Pro  
 245 250 255  
 Ser His Pro Glu Ser Val Pro Ile Asn Ala Leu Leu Ala Val Lys Gly  
 260 265 270  
 Thr Pro Leu Glu Asp Gln Lys Pro Val Glu Ile Trp Glu Met Ile Arg  
 275 280 285  
 Met Ile Gly Thr Ala Arg Ile Val Met Pro Lys Ala Met Val Arg Leu  
 290 295 300  
 Ser Ala Gly Arg Val Arg Phe Ser Met Ser Glu Gln Ala Leu Cys Phe  
 305 310 315 320  
 Leu Ala Gly Ala Asn Ser Ile Phe Thr Gly Glu Lys Leu Leu Thr Thr  
 325 330 335  
 Pro Asn Asn Asp Phe Asp Ala Asp Gln Leu Met Phe Lys Thr Leu Gly  
 340 345 350  
 Leu Ile Pro Lys Pro Pro Ser Phe Ser Glu Asp Asp Ser Glu Ser Glu  
 355 360 365  
 Asn Cys Glu Lys Val Ala Ser Ala Ser His  
 370 375

<210> 34  
 <211> 362  
 <212> PRT  
 <213> Saccharomyces cerevisiae

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 Asp Thr Pro Leu Ile Asp Leu Ile Phe Arg Ala Ala Ser Ile His Arg  
 35 40 45  
 Lys Phe His Asp Pro Lys Lys Val Gln Gln Cys Thr Leu Leu Ser Ile  
 50 55 60  
 Lys Thr Gly Gly Cys Thr Glu Asp Cys Lys Tyr Cys Ala Gln Ser Ser  
 65 70 75 80  
 Arg Tyr Asn Thr Gly Val Lys Ala Thr Lys Leu Met Lys Ile Asp Glu  
 85 90 95  
 Val Leu Glu Lys Ala Lys Ile Ala Lys Ala Lys Gly Ser Thr Arg Phe  
 100 105 110  
 Cys Met Gly Ser Ala Trp Arg Asp Leu Asn Gly Arg Asn Arg Thr Phe  
 115 120 125

Lys Asn Ile Leu Glu Ile Ile Lys Glu Val Arg Ser Met Asp Met Glu  
 130 135 140  
 Val Cys Val Thr Leu Gly Met Leu Asn Glu Gln Gln Ala Lys Glu Leu  
 145 150 155 160  
 Lys Asp Ala Gly Leu Thr Ala Tyr Asn His Asn Leu Asp Thr Ser Arg  
 165 170 175  
 Glu Tyr Tyr Ser Lys Ile Ile Ser Thr Arg Thr Tyr Asp Glu Arg Leu  
 180 185 190  
 Asn Thr Ile Asp Asn Leu Arg Lys Ala Gly Leu Lys Val Cys Ser Gly  
 195 200 205  
 Gly Ile Leu Gly Leu Gly Glu Lys Lys His Asp Arg Val Gly Leu Ile  
 210 215 220  
 His Ser Leu Ala Thr Met Pro Thr His Pro Glu Ser Val Pro Phe Asn  
 225 230 235 240  
 Leu Leu Val Pro Ile Pro Gly Thr Pro Val Gly Asp Ala Val Lys Glu  
 245 250 255  
 Arg Leu Pro Ile His Pro Phe Leu Arg Ser Ile Ala Thr Ala Arg Ile  
 260 265 270  
 Cys Met Pro Lys Thr Ile Ile Arg Phe Ala Ala Gly Arg Asn Thr Cys  
 275 280 285  
 Ser Glu Ser Glu Gln Ala Leu Ala Phe Met Ala Gly Ala Asn Ala Val  
 290 295 300  
 Phe Thr Gly Glu Lys Met Leu Leu Leu Leu Phe Leu Asp Ser Asp  
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 Ser Gln Leu Phe Tyr Asn Trp Gly Leu Glu Gly Met Gln Ser Phe Glu  
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 Lys Glu Arg Leu Ala Pro Ser Pro Ser Leu  
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<400> 35  
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 Ser Leu Val Arg Asn Asn Trp Thr Arg Glu Glu Ile Gln Lys Ile Tyr  
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 Asp Thr Pro Leu Ile Asp Leu Ile Phe Arg Ala Ala Ser Ile His Arg  
 35 40 45  
 Lys Phe His Asp Pro Lys Lys Val Gln Gln Cys Thr Leu Leu Ser Ile  
 50 55 60  
 Lys Thr Gly Gly Cys Thr Glu Asp Cys Lys Tyr Cys Ala Gln Ser Ser  
 65 70 75 80  
 Arg Tyr Asn Thr Gly Val Lys Ala Thr Lys Leu Met Lys Ile Asp Glu  
 85 90 95  
 Val Leu Glu Lys Ala Lys Ile Ala Lys Ala Lys Gly Ser Thr Arg Phe  
 100 105 110  
 Cys Met Gly Ser Ala Trp Arg Asp Leu Asn Gly Arg Asn Arg Thr Phe  
 115 120 125  
 Lys Asn Ile Leu Glu Ile Ile Lys Glu Val Arg Ser Met Asp Met Glu  
 130 135 140

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Cys | Val | Thr | Leu | Gly | Met | Leu | Asn | Glu | Gln | Gln | Ala | Lys | Glu | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Lys | Asp | Ala | Gly | Leu | Thr | Ala | Tyr | Asn | His | Asn | Leu | Asp | Thr | Ser | Arg |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Glu | Tyr | Tyr | Ser | Lys | Ile | Ile | Ser | Thr | Arg | Thr | Tyr | Asp | Glu | Arg | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Asn | Thr | Ile | Asp | Asn | Leu | Arg | Lys | Ala | Gly | Leu | Lys | Val | Cys | Ser | Gly |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Gly | Ile | Leu | Gly | Leu | Gly | Glu | Lys | Lys | His | Asp | Arg | Val | Gly | Leu | Ile |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| His | Ser | Leu | Ala | Thr | Met | Pro | Thr | His | Pro | Glu | Ser | Val | Pro | Phe | Asn |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | Leu | Val | Pro | Ile | Pro | Gly | Thr | Pro | Val | Gly | Asp | Ala | Val | Lys | Glu |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Arg | Leu | Pro | Ile | His | Pro | Phe | Leu | Arg | Ser | Ile | Ala | Thr | Ala | Arg | Ile |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Cys | Met | Pro | Lys | Thr | Ile | Ile | Arg | Phe | Ala | Ala | Gly | Arg | Asn | Thr | Cys |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ser | Glu | Ser | Glu | Gln | Ala | Leu | Ala | Phe | Met | Ala | Gly | Ala | Asn | Ala | Val |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Phe | Thr | Gly | Glu | Lys | Met | Leu | Thr | Thr | Pro | Ala | Val | Ser | Trp | Asp | Ser |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Asp | Ser | Gln | Leu | Phe | Tyr | Asn | Trp | Gly | Leu | Glu | Gly | Met | Gln | Ser | Phe |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     |     | 335 |     |
| Glu | Tyr | Gly | Thr | Ser | Thr | Glu | Gly | Glu | Asp | Gly | Thr | Phe | Thr | Leu | Pro |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Pro | Lys | Glu | Arg | Leu | Ala | Pro | Ser | Pro | Ser | Leu |     |     |     |     |     |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     |     |     |     |     |

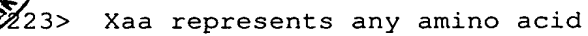
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<400> 36

Gly Xaa Cys Xaa Glu Asp Cys Xaa Tyr Cys Xaa Gln  
1 5 10

1

5

10

28